



# **Shale Gas Innovation and Commercialization Center- An Update April 9, 2012**

**Bill Hall**, Director  
billhall@psu.edu  
814 933 8203

Bill Hall, Director, Shale Gas  
Innovation and Commercialization  
Center



## Shale Gas Innovation &

### Mission:

- Discover, encourage and support translational research and technological developments in small companies
- To benefit the growth of the shale gas play in Pennsylvania in an environmentally sound manner



- **March 2011 Shale Gas Innovation and Commercialization Center born**
- **June 2011 Kicked-off study on Marcellus shale gas industry needs with ADI Analytics**
- **July 2011 Co-sponsored gas utilization workshop and Organized investor social hour**
- **September 2011 Co Sponsored Innovation EXPO at Insight 2011 and Awarded 2 winners including Nittany**

Bill Hall, Director, Shale Gas  
Innovation and Commercialization  
Center



## TimeLine of Events Continued

- **October 2011 Kicked-off \$50K Innovation Contest, with major donor BFTP but with 5 industry sponsors – critical for verification of ideas : **FNB – Chesapeake– MSC– Little Pine Resources – Schumberger****
- **November 2011 Co-sponsored shale gas monetization study**
- **November 2001 Innovation Workshop with 6 panelists and 20 research presentations, and 50 participants with MCOR Sponsor**
- **December 2011 Presented at Stripper Well Consortium**



## TimeLine of Events Continued

- **March 2012 Presentation at St Francis outreach event**
- **April 2012 SGICC Update CCNGTF**
- **May 2012 Presentation at Erie MSC event**
- **May 22, 2012 Innovation Contest Award Event**
- **September 5 and 6, 2012 Utilization Conference – Transportation and GTL focus with MCOR**



# ... Continuing outreach

- ▶ Producing a weekly newsletter summarizing news and journal coverage of Marcellus
- ▶ Growing list of recipients leading to a strong and broad response from various stakeholders



SGICC News: 10.12.11

[MSC's Kathryn Klaber discusses job creation](#) (Op-Ed) 10.11.11  
President Barack Obama was in Pittsburgh yesterday to speak about job creation. MSC's Kathryn Klaber reflects on how both parties can work toward common sense solutions aimed at lowering the nation's 9.1 unemployment rate with support for PA's expanding natural gas industry. Klaber notes the nation's energy savings with more supplies of American natural gas, a welcome savings during these historically challenging economic times. Citing a recent study by Penn State University researchers, Klaber points to PA consumers who have saved nearly \$633MM on their utility bills last year as American natural gas supplies expanded. (Source: Pittsburgh Post-Gazette)

[Marcellus Shale case appealed to Pa. Supreme Court could create 'chaos' by questioning ownership of gas rights](#) 10.10.11  
The Susquehanna County family involved in the court case over the definition of mineral rights has appealed to the state Supreme Court – now represented by Buchanan Ingersoll & Rooney. Attorneys at Buchanan Ingersoll & Rooney who appealed the case to the Supreme Court on Friday say they simply want the high court to reaffirm what's been "bedrock" property law for more 100 years, citing what's known as the "Dunham Rule" – a Supreme Court ruling that has stood since 1882 that a conveyance of "minerals" in a deed does not include oil and gas unless specifically stated. (Source: Harrisburg Patriot-News)

[How Much Gas is There in The Marcellus Shale?](#) 10.11.11  
The August USGS announcement created a good deal of uncertainty when the agency increased its estimate of undiscovered natural gas in the Marcellus from the 2 trillion cubic feet it figured back in 2002 to 84 tcf today. On first glance, this report from the USGS seemed to contradict one released just a month earlier from the U.S. EIA's report estimated that there were 410 tcf of recoverable gas in the Marcellus. Forbes takes a look at the variance between proven vs. potential reserves, showing the EIA and the USGS were looking at two entirely different concepts. According to guest columnist Rick Smead, Navigant Consulting's energy practice director, this would suggest that in time some or all of the 84 tcf USGS estimate would be additive to EIA's 410 tcf. (Source: Forbes Magazine)

[Marcellus Shale Research Network to assemble NSF-funded database for tracking water](#) 10.10.11  
Penn State researchers will lead the development of a collaborative database that will be able to track potential impacts of Marcellus Shale activity on water quality with \$750,000 of funding from NSF. The Marcellus Shale Research Network will consolidate and routinely update water data being collected by watershed groups, government agencies, industry stakeholders and universities as a searchable database, training community groups in how to organize, collect and interpret water data. Susan Brantley, director of Penn State's Earth and Environmental Systems Institute and the study's principal investigator will collaborate with other researchers from the University of Pittsburgh, Bucknell University and Dickinson College. (Source: PSU Live)

[PA Republicans Split Three Ways On Gas Drilling Tax](#) 10.10.11  
Former PA DEP Secretary John Hanger looks at the PA Republican Party and how Shale Gas taxes may shape up. Hanger notes how the PA GOP completely controls PA's government, but public pressure has split it into three camps on the drilling tax issue, making its outcome fluid and uncertain. The GOP splits mean that Democratic votes could be needed to pass any drilling fee or tax bill. (Source: John Hanger's Facts of The Day)

[Dominion seeks export of Marcellus Shale Gas as LNG](#) 10.9.11  
Richmond, Va.-based Dominion Resources Inc. is seeking federal approval to allow exports of liquefied natural gas from the booming Appalachian drilling industry, saying that the nation's natural gas supply is outpacing demand. Dominion Resources Inc. announced that it has applied to the DOE to allow 1 billion cubic feet per day to be exported through a terminal it owns in Maryland. The 9.1.11 application seeks permission for the exports of liquefied natural gas (LNG) to any country with which the United States does not prohibit trade. The Dominion Cove Point terminal on the Chesapeake Bay in Lusby, Md., is well-situated to export gas from the prolific Marcellus Shale and the promising Utica Shale formations. (Source: Harrisburg Patriot-News)

[PA Poll shows support of natural gas drilling](#) 10.11.11  
Most PA residents support "fracking" to extract natural gas from the Marcellus Shale, according to a new Mercyhurst College survey. However, respondents said they disapprove of gas drilling in state forests and parks and expressed significant concerns about the safety of water resources. Researchers at the Erie college conducted its first public-opinion poll on fracking with a random sample of 426 residents between Sept. 19 and Oct. 7. The survey's margin of error was 4.75 percent. (Source: Pittsburgh Post-Gazette)

200 Innovation Blvd, Suite 115 · State College, PA 16803 · 814-863-4881 · www.SGICC.org

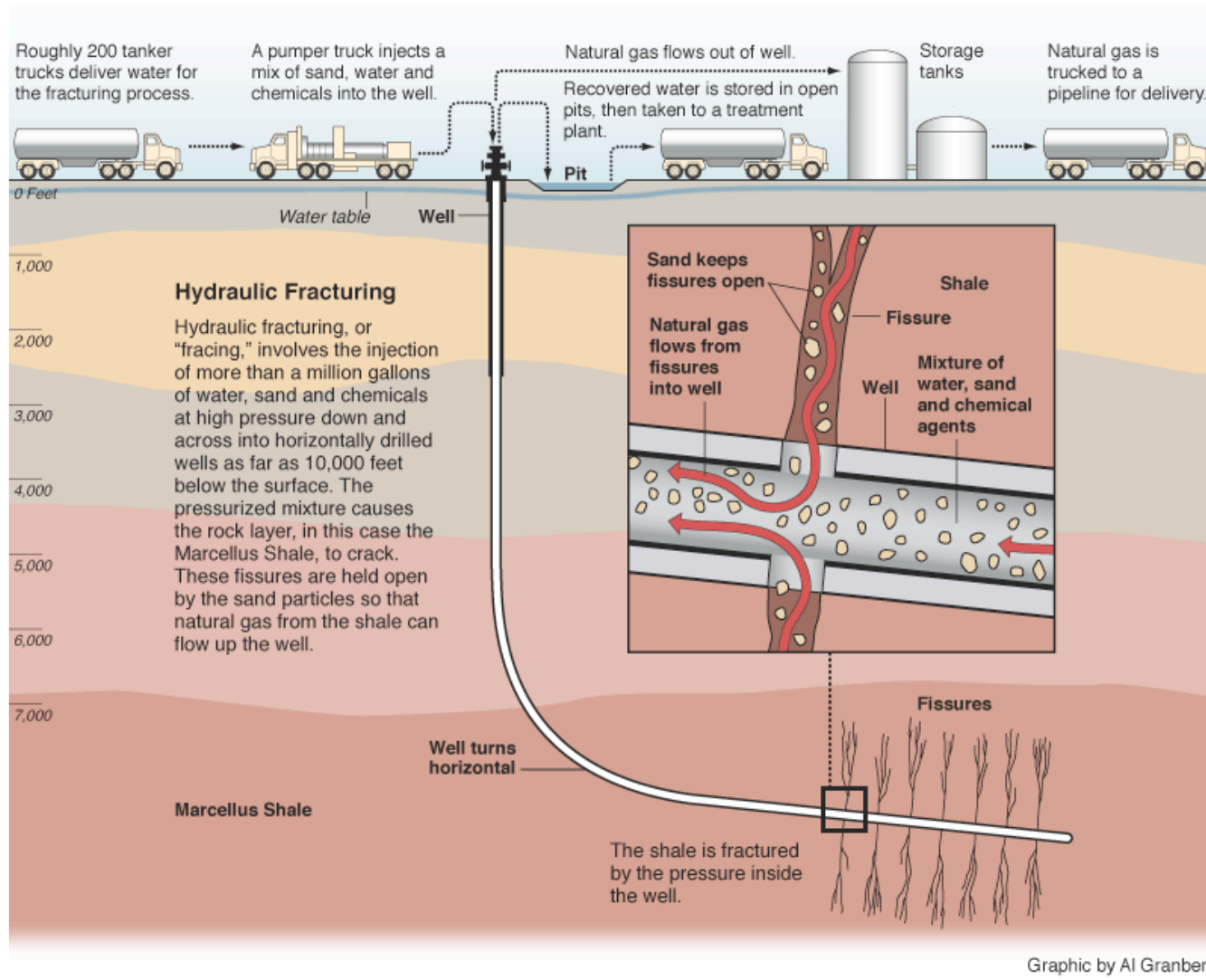
Bill Hall, Director, Shale Gas  
Innovation and Commercialization  
Center



## Actions– Investments

- **March 2011 – Nittany Extraction Technologies**
- **Fall 2011 – PSU/GOH/Mack CNG Engine conversion**
- **Fall 2011 – PSU/ Little Pine Resources Mirco Grid in Clearfield County**
- **Spring 2012 PSU/ CONSOL/ HydroRecovery AMD Treatment**
- **Assisting a start up company convert off the road vehicles to utilize LNG**

# ... With hydraulic fracturing being an enabling technology







## **Working closely with an Industry Expert Consultant(ADI ANALYTICS) to Identify**

Addressed opportunities of Interest to the Shale Gas Companies in 4 areas:

- Exploration
- Drilling & Completion
- Monetization
- Right to Operate

Bill Hall, Director, Shale Gas  
Innovation and Commercialization  
Center

... Our industry needs study has confirmed that

### Major Innovation Challenges



#### Exploration

- 1 Ability to identify “sweet spots”
- 2 Improve predictive modeling capabilities
- 3 Develop tools for hydrocarbon characterization

#### Drilling & Completions

- 4 Develop faster, cheaper, and cleaner D&C technologies
- 5 Improve fracturing effectiveness with fewer non-performing fractures
- 6 Increase hydrocarbon recovery or reduce shale gas well decline rates

#### Gas Monetization and Right to Operate

- 7 Increase attractiveness and adoption of natural gas-based transportation
- 8 Develop cheap and scalable natural gas conversion / utilization processes
- 9 Optimize water footprint through reduction, recycle, and treatment processes



## Critical Needs Areas Analysis

### Take Away From this Exercise....

- Although the oil & gas industry has been around for a very long time, **the shale gas play is new and revolutionary!**
- Opportunities for Innovation and New Product and Service Solutions are needed all along the value chain



## **\$50,000 Shale Gas Innovation Contest – Sponsors** **–BFTP– FNB – Chesapeake – MSC– Little Pine**

- 2 Prizes – \$25,000 Each
- Most Promising New Technology
- Best New Product or Service
- Entrepreneurs or small companies
- 54 Entries

Bill Hall, Director, Shale Gas  
Innovation and Commercialization  
Center



## \$50,000 Shale Gas Innovation Contest

- Judges – FNB – Chesapeake – MSC– Little Pine Resources – Schumberger and CONSOL
- 12 Finalists
  - Aither Chemicals – start up GTL Plant
  - Joel Anstrom – Engine conversion research
  - Andre Boehman – DME Fuels from NG
  - Greenways – New Product – Mobil Filter Press





## \$50,000 Shale Gas Innovation Contest

- Judges – FNB – Chesapeake – MSC– Little Pine Resources – Schumberger and CONSOL
- 12 Finalists – Continued
  - HydroConfidence, Inc. – Hydrocarbon Monitoring
  - J&J Truck Bodies & Trailers – Dust Control System
  - Microenergies LLC – Smaller Scale GTL
  - OSComp Systems, Inc. – Rotary compressor



## \$50,000 Shale Gas Innovation Contest

- Judges – FNB – Chesapeake – MSC– Little Pine Resources – Schumberger and CONSOL
- 12 Finalists – Continued
  - Polymics Ltd – Leak proof thick poly mats
  - ProChem Tech – WWT
  - Seraph Energy LLC – NG Engine conversion
  - S4Worldwide LLC – Mobil telecommunications and security



## **\$50,000 Shale Gas Innovation Contest**

- Judges – **FNB – Chesapeake – MSC– Little Pine Resources – Schumberger and CONSOL**

### **Next Steps**

- Each Company will provide a limited PP
- Final –presentations made on May 22, 2–4pm  
Hilton Inn Harrisburg



## In Closing....

- Opportunities for Innovation & Commercialization exist all along the value/supply chain
- **Role of SGICC?**
  - Continue the conversation with industry, researchers, and entrepreneurs
  - host topic specific seminars, webinars, etc.
  - Continue to be a focal point for Innovation
  - Bridge the research/entrepreneurial gap to

Bill Hall, Director, Shale Gas  
Innovation and Commercialization  
Center